

SUMMARY

Methicillin-resistant *Staphylococcus aureus* (MRSA) is one of the bacteria that can produce biofilm. Biofilm inhibits the action of antibiotics with bacteria causing antibiotic resistance. Betel leaves (*Piper betle*) have been known as one of the medicinal plants for anti-biofilm that contains secondary metabolites. Thus, Betel leaves extract might have the potential to produce bioactive as an anti-MRSA compound. Therefore, this research aimed to analyze the ethanol extract from Betel leaves against MRSA in terms of antibacterial activity, biofilm formation inhibition, biofilm degradation, and determination of its chemical compounds.

The research used experimentally with a completely randomized design (CRD). In this research, there were 10 treatments consisting of 9 extract concentration treatments of green and red Betel (100%, 50%, 25%, 12.5%, 6.25%, 3.125 %, 1.56%, 0.78% and 0%), and Streptomycin as positive control. Antibacterial testing used the tube dilution test method with Mueller-Hinton Broth (MHB) liquid medium to determine MIC. The antibiofilm test used the microtiter method to determine the inhibition biofilm formation and biofilm degradation. The microbes were cultured on BHI + 1% glucose medium for 24 hours, then stained with crystal violet. The biofilms were observed at λ 600 nm with an ELISA reader. The main parameters measured were the value of MIC, MBIC, and MBRC. The supportive parameters, the bioactive compounds in green and red Betel leaf extract, were analyzed with GC-MS. The data obtained was analyzed using the Analysis of Variance (ANOVA) at 1% and 5% error rates and continued analyzed with Duncan's statistical test

The results showed that the ethanol extract of green betel leaf had a higher ability to inhibit the growth of MRSA and the biofilm formation due to the presence of 1,8 cineole compound. The extract was also higher than red betel extract in its ability to degrade biofilms due to the presence of dedanoic acid, lauric acid and phosphonic acid compounds. The representative chemical compounds in green Betel leaves were phenol and its derivatives such as chavichol, dedaconic acid, lauric acid, benzene, 1,8 cineole, amino acid, and terpene. While in red Betel leaves were phenol compound, lauric acid, phosphoric acid, phosphonic acid, flavanone, benzene, and acetic acid.

Keywords: anti-MRSA, biofilm, *Piper betle*, *Staphylococcus aureus*